

Work Order ID 152053

Wednesday, October 19, 2016 2:47:27 PM

152053

Page 1

Item ID: D412-664-209

Accept

N900040100

Setup Start

NS1

Revision ID:

Stop

NS2

Item Name: Aft Crosstube - Low Standard

Start Date: 11/1/2016 Start Qty: 1.00

1

Cust Item ID:

Required Date: 11/15/2016 Req'd Qty: 1.00

1

Customer:

Reference: RD16-682-01

Approvals: Process Plan: 

Date: 16-10-19

Tooling:

Date:

Run Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr

Revision Nbr

D412-664-249

C

100

Document Control

0.00

100

DOCUMENT CONTROL

0.00

DC

Memo

Doc.Control -USB or Paperwork

Photocopy bluefile and create labels as per PPP D412-664-209 CHG005

NIA 16/10/26

110

Packaging

0.00

110

Packaging

Memo

Packaging

NIA 16/10/26

16-11-14

120

BENDING MACHINE - CROSSTUBES

0.00

120

CNC Bend 2

Memo

CNC Alpha 160 Bender

Bend tube as per Dwg D412-664-249 using CNC bender program and Folio FT

DP216-11-15

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Item ID: D412-664-209

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N900040100

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Stop

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Item Name: Aft Crosstube - Low Standard

Start Date: 11/1/2016 Start Qty: 1.00

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Cust Item ID:

Required Date: 11/15/2016 Req'd Qty: 1.00

1

Customer:

Reference: RD16-682-01

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run

Start

NR1

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130	QC15- Crosstube Dimensional Check	0.00				1	0		DAS 47 9-89
130									
QC	Memo	0.00							

Quality Control

140

140

Crosstubes

Crosstubes

Crosstubes

Memo

***** ENSURE PROPER JIG POSITIONING *****

- 1-Drill Rivet holes as per Dwg D412-664-249 .
 - 2-Drill pilot holes in tube as per Dwg D412-664-249
 - 3-Ream hole to finish size in tube as per Dwg D412-664-249
 - 4-*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***
- Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D412-664-249

DH 16-11-17

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Item ID: D412-664-209

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N900040100

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NS1

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Customer:

Reference: RD16-682-01

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start

NR1

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150		0.00							
150									
HandFXtube	Memo	0.00							
Hand Finishing Crosstubes	***IMMEDIATELY AFTER GRINDING***								
	1- PRESSURE WASH X-TUBE INSIDE AND OUT								
	2- ALODINE AND ACID ETCH X-TUBE INSIDE AND OUT AS PER QSI005.								
160		0.00							
160									
QC	Memo	0.00							
Quality Control									
170		0.00							
170									
QC	Memo	0.00							
Quality Control									

DPZ 16-11-17

DAS
38
9-89

NOV 22 2016

Qc5

M/A
DAS
38
9-89

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Item ID: D412-664-209 Accept ***N900040100*** Setup Start ***NS1***
Revision ID: Stop ***NS2***
Item Name: Aft Crosstube - Low Standard
Start Date: 11/1/2016 Start Qty: 1.00 ***1*** Cust Item ID:
Required Date: 11/15/2016 Req'd Qty: 1.00 ***1*** Customer:
Reference: RD16-682-01

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180 *180* Outsource2 Outsource process - NDT	Memo *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Liquid Penetrant Inspection as per QSI 038 Issue P/O: <u>34370</u> LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order	0.00 0.00				<u>1</u>		NOV 23 2016	DAS 13 9-89
190 *190* Packaging Packaging Packaging	Memo *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Ensure copy of NDT results attached to work order.	0.00 0.00							<u>1x</u> <u>SP16-11-23</u>
200 *200* QC Quality Control	Memo *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Inspect for damage & ensure results are as per Dwg D412-664-209	0.00 0.00				<u>1</u>			DAS 38 9-89 NOV 25 2016

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[illegible]

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Item ID: D412-664-209

Accept

N900040100

Setup Start

NS1

Revision ID:

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Item Name: Aft Crosstube - Low Standard

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Cust Item ID:

Required Date: 11/15/2016 Req'd Qty: 1.00

1

Customer:

Reference: RD16-682-01

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start

NR1

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
220	SprayPaint	0.00				1			DAS 41 9-89
220									16-11-25
SprayPaint	Memo	0.00							
Spray Painting	*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***								
	1-Prime inside and outside crosstube as per QSI 005 4.2								
	PRIMER: <u>135953</u>								
	START TIME: <u>700</u>								
	FINISH TIME: <u>800</u>								
	2-Paint outside crosstube with White Imron as per QSI 005 4.2								
	PAINT: <u>136040</u>								
	Start Time: <u>100</u>								
	Finish Time: <u>200</u>								
230	QC14- Inspect Spray Paint	0.00				1			DAS 38 9-89
230									DEC 02 2016
QC	Memo	0.00							
Quality Control	Then,Wrap in plastic bag to protect from scratches								

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Item ID: D412-664-209 Accept ***N900040100*** Setup Start ***NS1***
Revision ID: Stop ***NS2***
Item Name: Aft Crosstube - Low Standard
Start Date: 11/1/2016 Start Qty: 1.00 ***1*** Cust Item ID:
Required Date: 11/15/2016 Req'd Qty: 1.00 ***1*** Customer:
Reference: RD16-682-01

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
240	Crosstubes	0.00							
240						<u>1</u>			<u>47</u> <u>989</u>
Crosstubes	Memo	0.00							<u>16-11-29</u>
Crosstubes	1- Install center support using scotch-weld DP460 per QSI 015, as per DWG. note 15. Install supports clamps using as per Dwg D412-644-249. Install clamp with rubber cushion as per DWG. note 16. ***ENSURE CLAMPS ARE ON TOP OF CROSSTUBE SUPPORT*** Torque clamps on support to 80-100 IN-LBS AS PER DWG.								
	A/R scotch-weld DP460	BATCH #: <u>134469</u> EXP DATE: <u>4/17</u>							
	2- **IF NOT ALREADY PRESENT ON CHAFFING SHEILD.** Apply a thin coat of proseal 890 per QSI 015 on inside concave surface of chafing shield and let cure per manufacturer's instructions. Install prosealed chafing shield onto crosstube by applying a thin coat of proseal 890 onto crosstube. Be sure to eliminate any air gaps. Install and torque clamps on chafing shield to 40-50 IN-LBS AS PER DWG.								
	A/R Proseal 890	Batch: <u>136076</u> EXP DATE: <u>5/17</u>							
	AFTER FINISH CURE TIME 24H START CURE TIME: <u>16-11-29</u> FINISH CURE TIME: <u>16-11-30</u>								
	PRIOR TO PACKAGING RE-CHECK TORQUE ON CLAMPS AFTER CURED FOR 24H.								
	4-Install nut plates as per Dwg D412-664-249 Touch-up rivet heads with Imron paint.								

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N/A 6/16/20

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Item ID: D412-664-209 Accept ***N900040100*** Setup Start ***NS1***
Revision ID: Stop ***NS2***
Item Name: Aft Crosstube - Low Standard
Start Date: 11/1/2016 Start Qty: 1.00 ***1*** Cust Item ID:
Required Date: 11/15/2016 Req'd Qty: 1.00 ***1*** Customer:
Reference: RD16-682-01

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
270	Packaging	0.00							
270	Packaging								
Packaging	Memo	0.00							
Packaging	Identify and pack for shipping as per PPP D412-664-209								
280	QC21- Final Inspection - Work Order Release	0.00							
280									
QC	Memo	0.00							
Quality Control									

N/A 4/16/10/26

RD16-682-01

16-12-2

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Parent Item: D412-664-209

D412-664-209

Parent Item Name: Aft Crosstube - Low Standard**Start Date:** 11/1/2016**Required Date:** 11/15/2016

Start Qty: 1.00

Required Qty: 1.00

Comments:

IPP Rev:A New Issue 07.09.12 EC verified by: JLM
 IPP Rev:B ECN 1100 08-01-11 DD verified by EC
 IPP Rev:C ECN 1121 08-02-25 DD verified by:EC
 IPP Rev:D 08-06-12 add comment in seq. 24 DD verified
 by:EC
 11.10.03 DEO D412-664-249-B-2 DD verf:EC

IPP REV:E

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
AN6-40A		Purchased	No			260	Each	44.0000	4	4			
AN6-40A													
3/8-24 Bolt X 3" Long													
				<u>Location</u>		<u>Loc Qty</u>		<u>Loc Code</u>					
				ST333		44							
				M133769		4							
				M134509		10							
				M135297		30							
AN6-41A		Purchased	No			260	Each	36.0000	2	2			
AN6-41A													
Bolt													
				<u>Location</u>		<u>Loc Qty</u>		<u>Loc Code</u>					
				over005		20							
				M135767		20							
				ST333		16							
				M134508		16							
CR3212-4-07		Purchased	No			240	Each	278.0000	44	44			
CR3212-4-07													
CHERRY RIVET													
				<u>Location</u>		<u>Loc Qty</u>		<u>Loc Code</u>					
				Lg0056		178							
				m133031		178							
				ST320		100							
				m135702		100							

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date : _____	Step #: _____	QTY Effective : _____		MRB (QSI042) Approval 	
Description Work Order Deviation		Disposition			
				Completed By _____	
				Lead hand / Supervisor Approval Verification	
				QC / QA Coordinator Approval	
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐			
OTHER : ☐ _____					

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Work Order ID: 152053

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Parent Item: D412-664-209

D412-664-209

Parent Item Name: Aft Crosstube - Low Standard

Start Date: 11/1/2016

Required Date: 11/15/2016

Start Qty: 1.00

Required Qty: 1.00

D2896-1 Manufactured No

240

Each

15.0000

1

1

DAS

41

9-89

16-11-29

D2896-1

Support

**

Location

Loc Qty

Loc Code

LG051

15

145014

6

148418

9

D3189-1 Manufactured No

240

Each

9.0000

2

2

DAS

41

9-89

16-11-29

D3189-1

Chaffing Shield

**

Location

Loc Qty

Loc Code

LG051

9

145416

9

D3595-063-570 Manufactured No

240

Each

43.0000

2

2

DAS

41

9-89

16-11-29

D3595-063-570

Rubber Cushion 0.63" wide x 5.70" Long

**

Location

Loc Qty

Loc Code

FG

8

42243

8

LG052

35

144834

35

D3660-1 Manufactured No

220

Each

6.0000

2

2

D3660-1

Cuff

**

Location

Loc Qty

Loc Code

ST509

6

136555

6

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DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. BAC 7A 06.0	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐				
Date : BAC 7A 06.0	Step #:	QTY Effective :			MRB (QSI042) Approval	
Description Work Order Deviation		Disposition			Completed By	
BAC 7A 06.0 BAC 7A 06.0					Lead hand / Supervisor Approval Verification	
					QC / QA Coordinator Approval	
Root Cause		FAULT CATEGORY				
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐	No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐	Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐	Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐	Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐	
OTHER : ☐						

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Work Order ID: 152053

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Parent Item: D412-664-209

D412-664-209

Parent Item Name: Aft Crosstube - Low Standard

Start Date: 11/1/2016

Required Date: 11/15/2016

Start Qty: 1.00

Required Qty: 1.00

D412-664-209TRN

Manufactured No

140

Each

4.0000

1

1

D412-664-209TRN

Crosstube Turning Detail

137 030

Location

Loc Qty

Loc Code

LG014

4

137027

1

137028

1

137029

1

137030

1

MS21042L6

Purchased

No

260

Each

268.0000

6

6

MS21042L6

Nut

Location

Loc Qty

Loc Code

ST303

268

m135058

18

m135442

50

m135704

100

m135864

100

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DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date :	Step #:	QTY Effective :		MRB (QSI042) Approval	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor Approval Verification	
				QC / QA Coordinator Approval	
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐			
		OTHER :			

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Parent Item: D412-664-209

D412-664-209

Parent Item Name: Aft Crosstube - Low Standard

Start Date: 11/1/2016

Required Date: 11/15/2016

Start Qty: 1.00

Required Qty: 1.00

MS21920-28

Purchased

No

240

Each

127.0000

4

4

MS21920-28

Clamp

DAS
41
9-89

16-11-28-29

Location

Loc Qty

Loc Code

FG

1

105884

1

LG050

118

M135009

43

M135774

25

M135859

50

LG051

1

M132169

1

LG057

2

M134130

2

st543

5

M135007

5

MS21920-30

Purchased

No

240

Each

39.0000

2

2

MS21920-30

Clamp

DAS
41
9-89

16-11-29

Location

Loc Qty

Loc Code

LG57

39

m131689

6

m134257

13

m135127

20

NAS1149D0663J

Purchased

No

100

Each

593.0000

18

18

NAS1149D0663.J

Washer

Location

Loc Qty

Loc Code

ST260

215

M131618

215

ST263

378

M135464

378

N/A
16-11-22

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. 241		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date : 241		Step #:		QTY Effective :			MRB (QSI042) Approval		
Description Work Order Deviation				Disposition				Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval	
241 241 241									
Root Cause		FAULT CATEGORY							
Environment ☐	☐ No Re-verification	☐ Pressure/Forced	☐ Temperature/Cure	☐ Power Loss/Surge	☐ Positioned Wrong				
Design ☐	☐ Operator	☐ Bending	☐ Set-up	☐ Folio/Program	☐ Outside Dimensions				
Doc/Data ☐	☐ Offset/Setup	☐ Centre Not Concentric	☐ BOM/Route	☐ Grain	☐ Over/Under tolerance				
Equip/Tooling ☐	☐ Supplier	☐ Cracks	☐ Broken/Damage/Defect	☐ Weld	☐ Part Incorrect				
Handling/Pre ☐	☐ Training	☐ Crimp/Kink/Ripple/Wave	☐ Inspection Incomplete/Unqualified	☐ Wrong Stock Pulled	☐ Part Lost/Missing				
Material ☐	☐ Use for Testing	☐ Cuffs	☐ Contamination	☐ Out of Sequence	☐ Part Moved				
Internal Transport ☐	☐ Poor Information	☐ Crushing	☐ Countersink	☐ Off-set	☐ Drawing				
Tribal Knowledge ☐	☐ Rushing	☐ Heat Treat	☐ Cut Too Short	☐ Mislabeled	☐ Finish				
LOA ☐	☐ Product Improvement	☐ Wave/Twist in Tube	☐ Instructions Incomplete/Unclear	☐ Fit/Function	☐ Misread				
Substation ☐	☐ Process Improvement	☐ Marks/Chatter	☐ Drill Holes	☐ Misaligned/off center	☐ Turning Sequence				
Past Expiry Date ☐	☐ Manufacturing Process	OTHER :							
Misidentified ☐	☐ Past Due								

Item	Qty	Part Number	Description
	-249		
1	X	D412-664-249	CROSSTUBE ASSEMBLY (412 LOW AFT)
2	1	D6009-129	CROSSTUBE
3	1	D2896-1	SUPPORT
4	2	D3189-1	CHAFING SHIELD
5	2	D3595-063-570	RUBBER CUSHION
6	2	D3660-1	CUFF
7	44	CR3212-4-07	RIVET (OR M7885/3-4-07)
8	4	MS21920-28	CLAMP
9	2	MS21920-30	CLAMP (OR MS21920-32)
10	A/R	SCOTCH-WELD DP460	EPOXY ADHESIVE, 3M SCOTCH-WELD
11	A/R	PROSEAL 890	SEALANT, MIL-S-8802 CLASS B2
12	A/R	SIKAFLEX-241/-291	SEALANT (OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT)

GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D6009-129
FINISHED LENGTH = 127.826±0.020 (BEFORE BENDING/TRIMMING)
- FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D412-664-249" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- WEIGHT: 42.5 lbs
- PART IS SYMMETRIC ABOUT CENTERLINE.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

TURNING

- WHEN MACHINING TAPER, RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.

BENDING

- BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D., EXCEPT UP TO 10% IS ALLOWED IN AREA NOTED.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.

ASSEMBLY

- INSTALL D3660-1 CUFF AFTER CHEMICAL CONVERSION COAT BUT BEFORE PAINT, WITH A LAYER OF SIKAFLEX-241/-291 OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT BETWEEN CUFF AND CROSSTUBE. SEAL EDGE OF CUFF TO ENSURE NO GAPS.
- TOUCH-UP HOLES WITH CHEMICAL CONVERSION COAT.
- INSTALL D2896-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP460 PER QSI 015.
- INSTALL MS21920-30 CLAMPS (OR -32) WITH D3595-063-570 RUBBER CUSHIONS TO SECURE THE D2896-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE ON TOP SIDE OF CROSSTUBE.
- APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D3189-1 CHAFING SHIELD AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL PROSEAL D3189-1 CHAFING SHIELD ONTO CROSSTUBE BY APPLYING A THIN COAT OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.
- TORQUE CLAMPS ON D2896-1 SUPPORT 80 TO 100 IN-LB. TORQUE CLAMPS ON D3189-1 CHAFING SHIELD 40 TO 50 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVES HAVE CURED FOR 24 HOURS.

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 152053
MP 16-10-19

RELEASED
2014-05-26

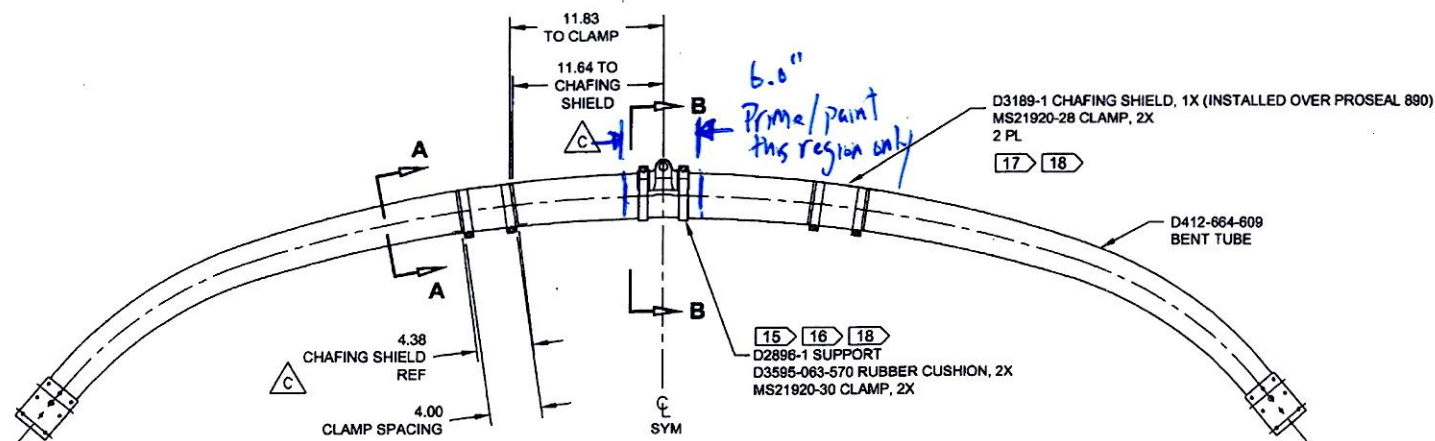
C	NOTES RE-ORDERED, SCOTCH-WELD WAS MAGNOBOND (C8-1), ADD CLAMP RETORQUE (A8-1). REMOVE ABRASION STRIP, CHAFING SHIELD NOW 4.38 WIDE (C8-2), CLAMPS FLIPPED TO PREVENT CHAFING (B7-2), INCORP. DEO B-1/2-3	CP	14.04.01
B	REVISE GENERAL NOTES; UPDATE TO CURRENT STANDARDS	RF	09.09.30
A	NEW ISSUE	CP	07.07.07
REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN			
CHECKED			
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	14.04.01		

DART AEROSPACE LTD
HAWKESBURY, ONTARIO, CANADA

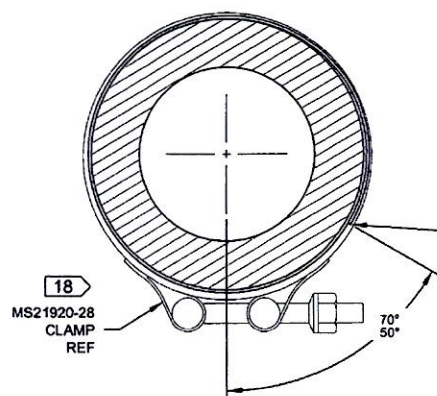
DRAWING NO. D412-664-249
REV. C
SHEET 1 OF 4

TITLE CROSSTUBE (412 LOW AFT)
SCALE NTS

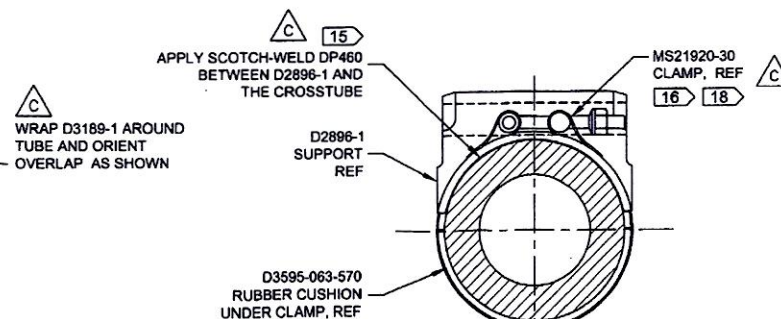
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D412-664-249
ASSEMBLY DETAIL



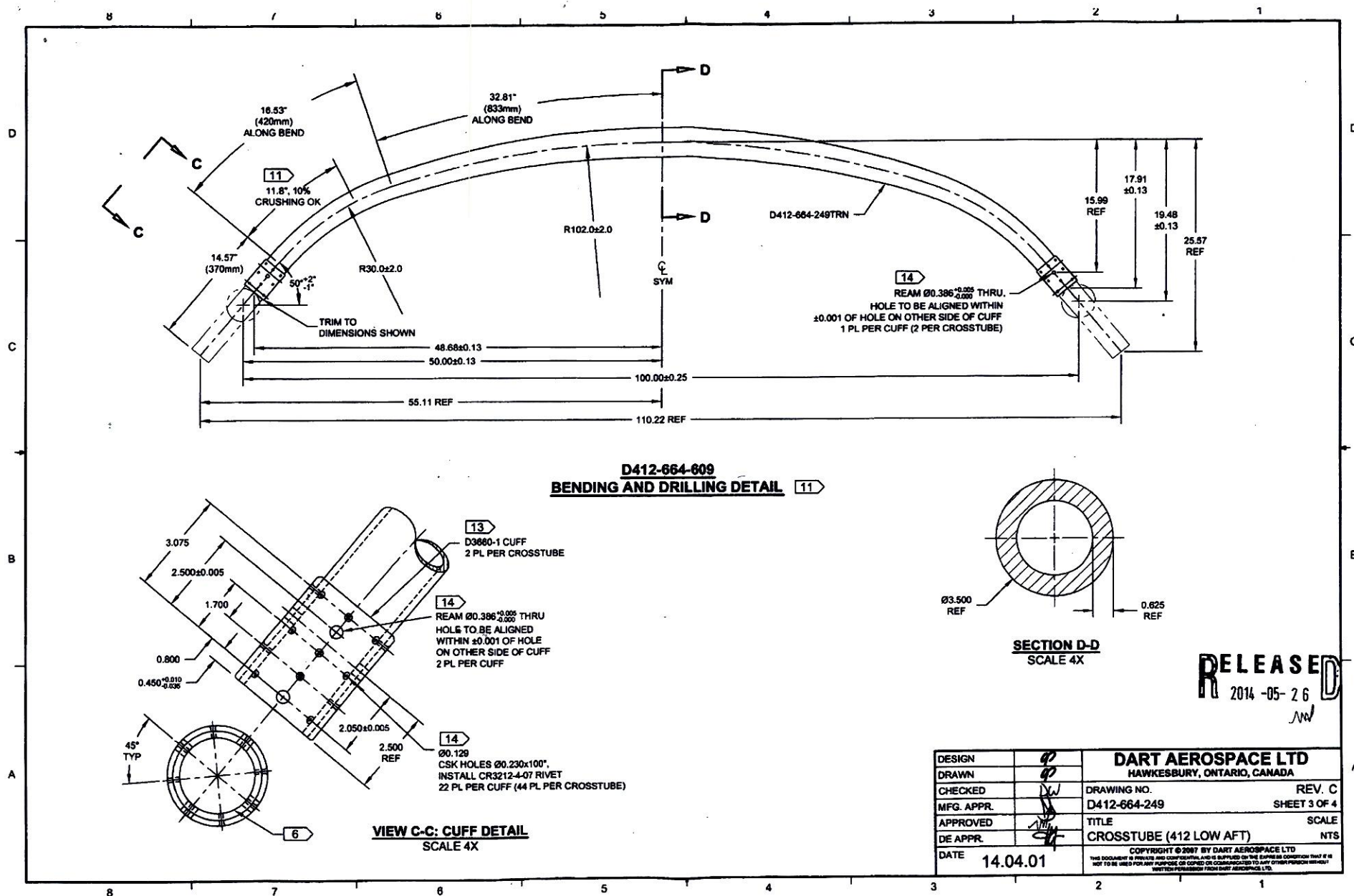
SECTION A-A D6-2
SCALE 6X

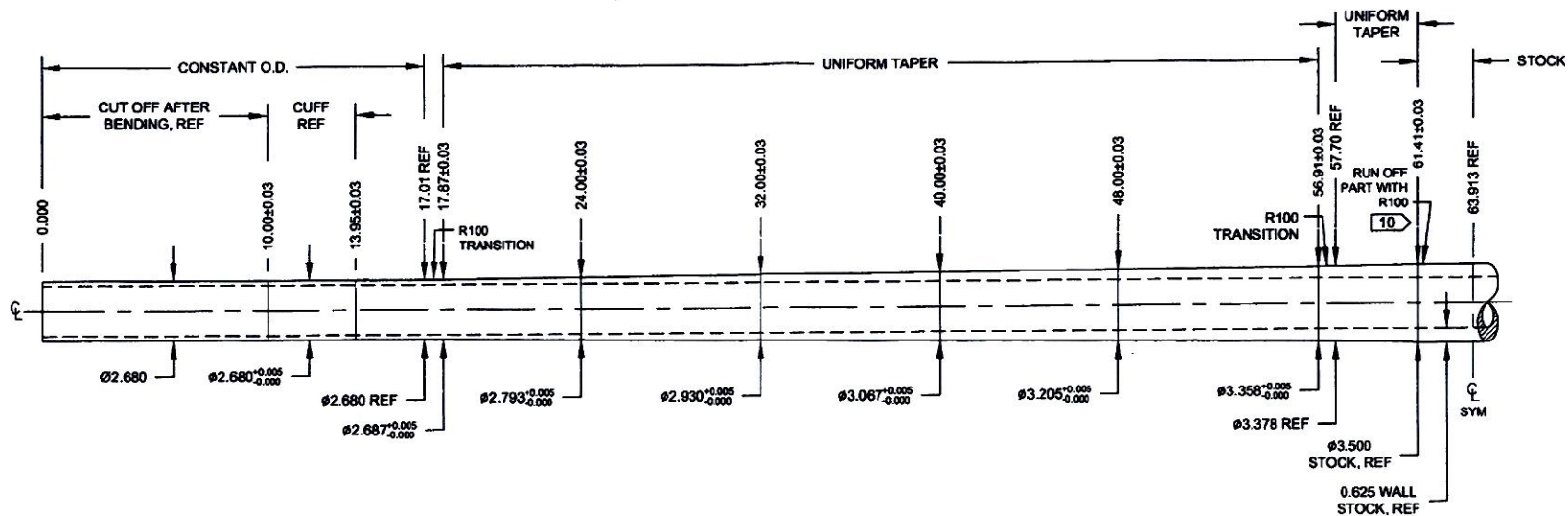


SECTION B-B
SCALE 4X

RELEASED
2014-05-26
MP

DESIGN		DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA		
DRAWN				
CHECKED			DRAWING NO.	REV. C
MFG. APPR.			D412-664-249	SHEET 2 OF 4
APPROVED			TITLE	SCALE
DE APPR.			CROSSTUBE (412 LOW AFT)	NTS
DATE	14.04.01		COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	





D412-664-249TRN
TURNING DETAIL

RELEASED
2014-05-26

DESIGN	92	DART AEROSPACE LTD	
DRAWN	92	HAWKESBURY, ONTARIO, CANADA	
CHECKED	DW	DRAWING NO.	REV. C
MFG. APPR.		D412-664-249	SHEET 4 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE (412 LOW AFT)	NTS
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DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

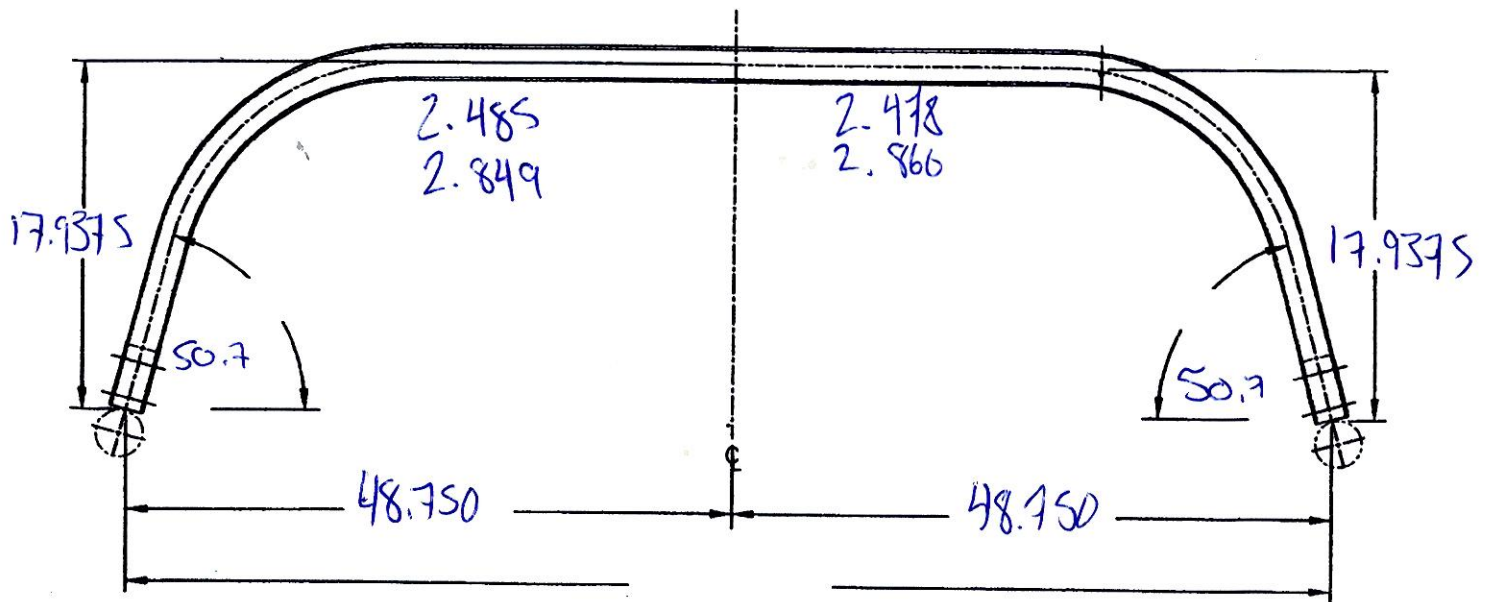
QA Closed: _____ Date: _____

Work Order update only ☒

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☒ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date: 16/10/26	Step #: 220	QTY Effective :		MRB (QSI042) Approval DAS 12 9-89 16/10/26 Completed By DAS 41 9-89 16-11-25	
Description Work Order Deviation Prime & paint only along 6" wide (approx.) region in center of tube to allow proper support banding. No clear "window".		Disposition For test. Ref marked-up dwg.		Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval	
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabelled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐			
OTHER :					

DART AEROSPACE LTD		Work Order:	
Description: Crosstube Low Aft (412)		Part Number:	D412-664-209
Inspection Dwg: D412-664-249 Rev: C			Page 1 of 1

Required Dimension	Min	Max
Height	17.78	18.04
1/2 Span	48.55	48.81
Angle	49	52
Total Span	97.1	97.62
Bending Passes	8	--
Crushing	--	6% / 10%



	Side A	Side B
Bending Passes	14	12
Crushing	6.8%	7.2%
Comments		
DAS		
47		

QC15 Inspection	9-89
Date	16-11-15

Rev	Date	Change	Revised by	Approved
A	08.02.29	New Issue	KJ/JM	
B	12.04.16	Added bending, crushing dimensions	KJ	
C	15.04.14	Dwg Rev updated	KJ	





Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO34370**

Purchase Order Date 11/18/2016

PO Print Date 11/23/2016

Page Number 2 of 2

Order From :
SKYSERVICE
6120 MIDFIELD ROAD
MISSISSAUGA, ONTARIO L5P 1B1
CANADA

VC-SKY001

Ship To : DART AEROSPACE LTD
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

Contact Name
Vendor Phone 905-678-5636

Ship To Contact
Ship To Phone
Ship Via: Delivered
Ship Acct:

Buyer Chantal Lavoie
Customer POID
Customer Tax # 10127-2607
Terms Net 30
Currency CAD
FOB FCA - (Free Carrier)

Line Total: \$0.00

3 152053 D412-664-209 11/23/2016 1.00 \$0.00 \$0.00
CROSSTUBE

Yes

11/23/2016

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR
LPI AS PER ASTM 1417 LEVEL 2

SP/611-23

Line Total: \$0.00

4 153143 D4882-1 STRUT 11/23/2016 6.00 \$0.00 \$0.00

Yes

11/23/2016

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR
LPI AS PER ASTM 1417 LEVEL 2

Line Total: \$0.00

PO Total: \$0.00

CL

Note: Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit www.dartaerospace.com for further explanation.

Change Nbr: 2

Change Date: 11/23/2016



skyservice Work Order Traveler

Sky Service F.B.O. Inc.

DOT APP 53-89 / EASA 145 7142 / BDA AMO 385

WO #: MWO29711

Customer: CASH SALE

Dept: NDT YUL

Reference: **P034370**

Descr:

PN:

DART AERO

S/N:

Qty: 1

Make:

Model:

Reg:

A/C S/N:

TSN:

CSN:

TSO:

Task: **UNSCHEDULED**

Sequence: 1

Work Required:

CARRY OUT NDT ON THE FOLLOWING AFT CROSSTUBES:

① ITEM # D412-664-209 WORK ORDER ID **152053**

② ITEM # D412-664-209 WORK ORDER ID **152061**

③ ~~NO CRACKS FOUND~~

③ **CARRY OUT NDT ON THE FOLLOWING STRUTS:**

ITEM # D4882-1 WORK ORDER ID **153143** **GEA**

Action Taken:

Date:

Initial/Stamp:

① **LIQUID PENETRANT INSPECTION CARRIED OUT IAW ASTM E1417 ON ITEM LISTED ABOVE**
NO CRACKS FOUND

23 NOV 2016

#19

② **LIQUID PENETRANT INSPECTION CARRIED OUT IAW ASTM E1417 ON ITEM LISTED ABOVE**
NO CRACKS FOUND

23 NOV 2016

#19

③ **LPI CARRIED OUT IAW ASTM E1417 ON ITEM LISTED ABOVE**
NO CRACKS FOUND

23 NOV 2016

#19

Description	Location	P/N	Qty	Batch	S/N Off	S/N On
LPI		PEN. AR500X 970P25E		TP019388		
BLACKLIGHT		S/N T-20990N				
BL METER		S/N T-21062				

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature:

Name:

GARY SMITH

ACA/SCA Stamp

#19

Date:

23 NOV 2016